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Smart Contract on a Crypto Assets in the Civil Law and Common Law Jurisdictions: Implementation of Best Practices

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Abstract

The article is devoted to the analysis on a crypto assets smart contract in the civil law and common law jurisdictions and the implementation of the best practices into Ukrainian law. It is argued that the essence of a crypto assets smart contract is that it is a self-executing contract which is represented and executed by a computer program, remains unchanged and unstoppable after the creation of this contract, and its terms are included in the internal functions of a decentralized database which is not controlled by the databases of the parties to the contract or third parties. It is noted that a cryptoasset smart contract, like any contract, may be declared invalid if the will to conclude it does not meet the conditions for the validity of this transaction, regardless of the form in which this transaction is concluded, as in this case in the form of a computer code. It is also stated that the terms of a cryptoasset smart contract must be specific (clear, unambiguous), feasible (objective), legitimate, and capable of automation (no evaluative terms, such as "reasonable time," may be used), exist within the blockchain platform (on which cryptoassets are currently transacted) and not involve obtaining and confirming information from outside (in this regard, the terms of force majeure are not specified in the smart contract). The study applies dialectical, comparative legal, formal and logical, and systemic and structural methods of scientific knowledge. It is proved that a smart contract is a contract which is represented and executed by a computer program, the components of which are a computer code, some or all of the terms of this contract which are fulfilled upon the occurrence of predefined events, are stored in an electronic register system which records the result of execution of this program, and the contract itself cannot be changed and is executed in accordance with the programmed instructions of the computer program. The author concludes that the determination of the person who is legally liable when a smart contract fails to perform the programmed function depends on the terms of the smart contract, and in their absence, the provisions of applicable law regarding the legal consequences of non-performance of the contract and liability for such non-performance should be used.

Keywords: blockchain, distributed ledger technology, smart contract, crypto assets, computer code, decentralized database.

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1. Introduction

Relevance of the study. Modern digital assets law is characterised by the rapid development of the market and legal regulation of crypto assets which are traded based of smart contracts. These contracts differ significantly from traditional contracts due to the peculiarities of the distributed ledger technology and the intangible nature of crypto assets as a type of digital property.

The absence of clear legal provisions on crypto asset smart contracts necessitates defining the concept and legal nature of these contracts, the specifics of the terms and conditions and performance of this type of smart contract, and liability for failure to perform these transactions, considering the best practices of their application in different jurisdictions.

The analysis and evaluation of scientific works shows that both Ukrainian and foreign researchers have paid attention to the problems of crypto asset smart contracts. Among domestic scholars, it is worth noting the works of O. A. Baranov, I. Veres, D. Zadobriuk, A. Navgorodsky, K. Nekit, L. Mamchuk, O. Nedybalyuk, A. M. Ivanov, V. O. Shmyg. The works of such foreign scholars as Lauren Scholz, Nick Szabo, Max Raskin, Darko Radić, Dejan Pilipović, Gilcrest Jack, Arthur Carvalho, Jelena Mamut, Mateja Durović, Franciszek Lech, Darko Radić, Dejan Pilipović, Tom Allen, Robin Widdison, Matthew McMillan, Sara Green are also quite important. However, despite the abundance and development of doctrine in this area, there are a significant number of problematic issues that require further research and resolution.

The purpose of this study is to highlight the conceptual legal provisions on the concept and legal nature of a smart contract for crypto assets, and to study the foreign experience of legal regulation of relations under a smart contract, its terms and conditions, and liability for non-performance of this contract with a view to implementing the best practices into Ukrainian law.

For this purpose, the author examines: (1) the concept of a smart contract; (2) a crypto asset smart contract as a legally binding contract; (3) types of smart contracts; (4) and legal regulation of a crypto asset smart contract in common law and civil law jurisdictions; (5) legal nature of a crypto asset smart contract; (6) terms; (7) conclusion, cancellation, amendment and termination of a crypto asset smart contract; (8) performance of a crypto asset smart contract; (9) and liability for breach of these contracts.

Methods. The study applies dialectical, comparative legal, formal logical and other methods of scientific cognition. In particular, the dialectical method was used to identify the existing approaches to the concept of a crypto asset smart contract. The comparative legal method was used to study the application of this contract in different jurisdictions. Formal-logical and system-structural methods determined the methodological basis for analysing the elements of a smart contract, its conclusion, refusal, amendment and termination, performance and liability for breach of this transaction.

2. Results

2.1 *The concept of a smart contract*

The idea and concept of a smart contract was first proposed by Nick Szabo in 1996, who considered a smart contract as a self-executing computer program capable of implementing the content of the contract, using mathematical algorithms to automatically execute transactions as soon as a pre-stipulated condition is met (Szabo, 1996).[1]

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[1] Nick Szabo, "Smart contracts: Building Blocks for Digital Markets," EXTROPY: The Journal of Transhumanist Thought, no. 16 (1996). Access:

The legal doctrine offers three main approaches to the concept of a smart contract, in particular as:

(1) a technical phenomenon – a piece of software code known as a software agent, created to perform certain tasks in the event of predefined conditions.

A certain modification of this approach is to understand the smart contract as a digital protocol for transmitting information (which is encrypted) that uses encrypted mathematical algorithms to automatically execute a transaction (contract) as soon as a specified condition occurs. In this regard, the automatic execution of a contract is made possible by a computer code that 'translates' the legal text (contract terms) into an operating programme [Raskin, 2017];[2] or

(2) as a legal smart contract – an automated and enforceable agreement. Automated through a computer, although some parts may require human intervention and control. Enforceable either through judicial enforcement of rights and obligations or through execution protected by computer code from unauthorised access (Clack, C., Bakshi, V. & Braine, L. (2016, revised March 2017);[3] or

(3) as a combination of 'two different models of a smart contract, namely as a technical phenomenon ("software code") that does not replace the agreement, but only automates its execution and a "legal smart-contract" containing the terms of the agreement sufficient to replace it in full or in part (it is an analogue of a written form of a transaction, a type of electronic transaction or a transaction in digital form) (Stark, 2016;[4] Clack, Bakshi, Braine, 2016; Nekit, 2020).[5]

The Ukrainian literature substantiates approaches to the legal nature of a smart contract that generally repeat or modify the above approaches. Thus, supporters of understanding a smart contract as a software code believe that this code is implemented in a computerised transaction protocol that fulfils the terms of the contract (Navgorodskyi, 2020).[6] Proponents of the contractual nature of a smart contract consider it as "an automated system for the execution of a contract concluded in another form" (Mamchur & Nedybaluyk, 2018),[7] or as "an innovative form of contracts, the conclusion, execution and termination of which takes place using networked

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http://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart_contracts_2.html.

[2] Max Raskin, "The Law and Legality of Smart Contracts," Georgetown Law Technology Review, vol. 1:2 (2017): 309.

[3] Clack, C., Bakshi, V. & Braine, L. (2016, revised March 2017). Smart Contract Templates: foundations, design landscape and research directions. https://www.researchgate.net/publication/305779577_Smart_Contract_Templates_foundations_design_landscape_and_research_directions_CDClack_VABakshi_and_LBraine_arxiv160800771_2016.

[4] Stark, J. (2016). Making sense of blockchain smart contracts. Access: https://www.coindesk.com/markets/2016/06/04/making-sense-of-blockchain-smart-contracts/.

[5] Clack, C., Bakshi, V. & Braine, L. (2016, revised March 2017). Smart Contract Templates: foundations, design landscape and research directions. Access: https://www.researchgate.net/publication/305779577_Smart_Contract_Templates_foundations_design_landscape_and_research_directions_CDClack_VABakshi_and_LBraine_arxiv160800771_2016.

[6] Navhorodskyi, A. (2020, November 25). *Smart contract: How to regulate blockchain technology in Ukraine?* My Right. Access: https://moe-pravo.com.ua/publications/smart-kontrakt-yak-vregulyuvaty-tehnologiyu-blokchejn-v-ukrayini/.

[7] Mamchur, L., & Nedybaluyk, O. (2018). Civil-law realities of permissibility of using a smart-contract in contractual relations. *History and Law Journal*, (2), 90-94. Access: https://evnuir.vnu.edu.ua/handle/123456789/16037.

computer software and/or hardware and software that are interconnected with physical or digital objects, with or without human participation" (Baranov, 2017).[8]

A smart contract is proposed to be a contract written in the form of a computer code that can be concluded, amended or terminated only with the help of a certain computer program and blockchain technology that allows transactions to be carried out without the intervention of financial institutions. Therefore, the parties to a smart contract need to choose an environment for concluding this type of agreement. Typically, Ethereum, as well as Polkadot, Ripple, and Tron, are such environments (Zadobrjuk, 2022).[9]

The simplest example of a smart contract is a vending machine. When you put money into the machine and select a product, it starts dispensing that product. If you do not put enough money in, the product will not be dispensed, and its transfer to the exit window will be interrupted. This is the most common simplified scheme underlying the idea of smart contracts [4][10].

In the doctrine of Ukrainian law, three approaches to the concept of a smart contract are proposed, as:

(1) "a software code (implemented in a computerised transaction protocol that fulfils the terms of the contract (Navgorodskyi, 2020),...[11] the will of the subject is expressed by special technical means in the form of a software code),"

(2) "an automated system for the performance of a contract concluded in another form" (Mamchur, 2018),[12] or

(3) "an innovative form of contracts, the conclusion, execution and termination of which takes place with the use of networked computer software and/or hardware and software that are interconnected with physical or digital objects, with or without human intervention" (Baranov, 2017).[13]

The proposed approaches to the concept of a smart contract do not comply with the legislative concept of an electronic document (Article 3 of the Law of Ukraine On Electronic Commerce[14] or recognise a smart contract as a method of automatic execution of previously concluded contracts and exclude the understanding of a smart contract as an independent type of contract,[15] or provide for the need to introduce another separate form of transaction – an innovative one, in addition to the already provided oral and written ones – electronic.

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[8] Baranov, O. A. (2017). The Internet of Things (IoT): Legal issues in the application of smart contracts. *Information and Law*, (4), 26–40. Access: https://doi.org/10.37750/2616-6798.2017.4(23).273096.

[9] Zadobrjuk D. What are smart contracts and what are the principles of their operation? 22.11.2022. [Electronic resource]. Access: https://lexinform.com.ua/yurydychna-praktyka/shho-take-smart-kontrakty-i-yaki-pryntsypy-yih-roboty/.

[10] Smart contracts - are they really contracts and are they really "smart". 22.04.2018. Access: https://protocol.ua/ua/smart_kontrakti_chi_spravdi_dogovori_ta_chi_diysno_rozumni/.

[11] Navgorodskyi A. Smart contract: how to regulate blockchain technology in Ukraine? Access: https://www.pravoconsult.com.ua/smartkontrakt/ (Date of access: 12.08.2020).

[12] Mamchur L., Nedybalyuk O. Civil and legal realities of admissibility of using a smart contract in contractual relations. Historical and legal journal. 2018. No. 2 (12). P. 90-94. P. 92.

[13] O. A. Baranov, Internet of Things (IoT): legal issues of using smart contracts. Information and law. 2017. No. 4(23). P. 26-40. Access: http://ippi.org.ua/sites/default/files/5_7.pdf. (Date of access: 12.08.2020)

[14] According to Clause 3 of Art. 3 of the Law of Ukraine On Electronic Commerce, an electronic form of information presentation is considered to be the documentation of information, which enables it to be reproduced in a visual form suitable for human perception. Accordingly, by means of software code, the parties cannot perceive the terms on which they have reached an agreement.

In this regard, it is important to identify the special features inherent in a smart contract, which usually include encryption and storage of data in the blockchain, autonomous execution of the contract, recording of the entire process of contract execution and the ability to read data (Radić, 2020).[16]

One of the defining features of a smart contract is that this contract is based on blockchain technology or a distributed database, which has the following characteristics: a blockchain is a data structure in the form of a list of linked blocks, each of which contains a link to the previous block; cryptography is used;[17] the principle of decentralisation is characteristic; it is a public database of all transactions between the parties to smart contracts in the blockchain network (Veres, 2020).[18]

Ukrainian law does not provide for the concept of blockchain or distributed ledger technology. Blockchain and DLT are essentially an analogue or element of the system for ensuring the turnover of virtual assets provided for by the Law of Ukraine On Virtual Assets, which means a software or hardware and software system for the exchange of electronic data that ensures the identification and turnover of virtual assets (paragraph 11 of part 1 of Article 1 of the Law) (Law of Ukraine On Digital Assets).[19]

The draft law On Cryptocurrency Circulation in Ukraine No. 7183 of 06.10.2017 defines the blockchain system as a decentralised public register of all cryptocurrency transactions conducted by a cryptocurrency transaction entity (Bill On Circulation of Cryptocurrency in Ukraine).[20]

Another characteristic feature of a smart contract is the special procedure for its "creation", which involves formalising the terms of the contract in electronic form (converting its terms and conditions, compiling it into a program code) and publishing it on the blockchain (by executing a transaction at a special address, which is confirmed by the smart contract's own address, which can be used by other users to interact with it).

One of the stages of creating a smart contract is to write a code that will serve as an algorithm for actions when the parties begin to fulfil their obligations. 'A smart contract may sound like this: "When Person 1 pays Person 2 the amount of 100 ETH (Ethereum) for a certain item, Person 1 will receive this item in the following way."

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[15] However, a smart contract is a transaction that can be aimed not only at the fulfilment of existing contractual obligations, but also at their occurrence.

[16] Darko Radić, Dejan Pilipović, SMART CONTRACT – CHALLENGES AND PERSPECTIVES 111–140: p. 117-119. International Scientific Conference of Special Importance: "Transformative Technologies: Legal and Ethical Challenges of the 21st Century" 07-08 February 2020, Banja Luka Conference Proceedings Međunarodni naučni skup od posebnog značaja: "Transformativne tehnologije: pravni i etički izazovi XXI vijeka", 07-08. februar 2020, Banja Luka Zbornik radova Banja Luka, 2020. godine.

[17] Data that is stored in the blockchain is considered cryptographically secure. Any attempt to change the contents of a block invalidates the unique references that point to its location in the chain.

[18] Veres I. Legal nature of a smart contract // Entrepreneurship, economy and law. 2020. № 9. 15:18. P.15.- Access: xpgp-journal.kiev.ua/archive/2020/9/4.pdf.

[19] Law of Ukraine On Digital Assets, dated February 17, 2022, No. 2075-IX. [Electronic resource]. Access: https://zakon.rada.gov.ua/laws/show/2074-20#Text.

[20] Bill On Circulation of Cryptocurrency in Ukraine, No. 7183 dated 06.10.2017. Access: http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=62684 (Date of access: 12.08.2020).

Of course, smart contracts can be different, for example, there is such a type as a “safe” when a smart contract does not provide access to assets until a certain date (Zadobryuk, 2022).[21]

The relationship between the parties can be formalised in one of two ways: the code either completely replaces a regular contract or is an integral part of such a contract. This is the so-called built-in or internal model. Sometimes the terms legal smart contract and smart contract code are used to describe these models (Nekit, 2022).[22]

The distinctive features of a crypto asset smart contract are due since it is a computer program, which is a computer code, all the terms of this contract and the result of its execution are recorded and stored in the electronic blockchain register (Tech in Asia Indonesia, 2020; Endramanto et al., 2021].[23]

At the same time, the computer programme confirms and fulfils the terms of the smart contract upon the occurrence of predefined events, and the smart contract itself, after being encoded and entered it the blockchain, cannot be changed and is executed in accordance with the programmed instructions of the computer instruction.

In this regard, smart contract shall be a legally binding bilateral agreement, in which some or all of the contractual obligations are defined in and/or performed automatically by computer program upon the occurrence of predefined events, stored in the blockchain electronic registry system, in which the result of the program execution is recorded in the electronic registry, and the contract itself cannot be changed and is executed in accordance with the programmed instructions of the computer program.

2.2 *Smart contract as a legally binding contract*

A crypto asset smart contract, regardless of the existence of special provisions on smart contracts in the applicable law, should be treated as a legally binding contract if the mandatory requirements of the laws, such as agreement, consideration, essential terms, formality requirements/compliance with formalities (form of the contract, conclusion of the contract), and conditions of validity, are met.

Within the meaning of Part 1 of Article 626 of the Civil Code of Ukraine, a cryptoasset smart contract is an agreement of the parties if this agreement is aimed at establishing, changing or terminating civil rights and obligations. A crypto asset smart contract meets this requirement, as the agreement of the parties is usually aimed at transferring ownership of crypto assets.

Pursuant to Article 509(1) of the Civil Code of Ukraine, a crypto asset smart contract is legally binding if it is supported by a provision, which means that one party (the debtor) is obliged to perform a certain action (transfer crypto assets, pay money, etc.), and the other party (the creditor) has the right to demand that the debtor fulfil its obligation.

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[21] Zadobryuk, D. What are smart contracts and what are the principles of their operation? 22.11.2022. - Access: https://lexinform.com.ua/yurydychna-praktyka/shho-take-smart-kontrakty-i-yaki-pryntsypy-yih-roboty/.

[22] See, Nekit K. G. Advantages and disadvantages of smart contracts as grounds for the emergence of property rights. Access: http://visnyk-psp.kpi.ua/article/view/229494/228501 (Date of access: 16.04.2022); Smart contracts and distributed ledger – a legal perspective. ISDA Linklaters Whitepaper. August 2017. P. 5–6.

[23] See, Tech in Asia Indonesia - Komunitas Online Startup di Asia. [Online]. Available: https://id.techinasia.com/smart-contract-dankontroversinya [Accessed: 14-Jan-2020]; Vian Endramanto, Agri Adriel Bororing, Anak Agung Istri Krisna Gangga Dewi, Gunawan Wang, Sfenrianto, Applying Smart Contract in Indonesian E-Commerce. International Journal of Advanced Trends in Computer Science and Engineering. 2021. Volume 10, No. 5. 3020:3022.

According to part 1 of Article 638 of the Civil Code of Ukraine, a crypto asset smart contract is concluded if the parties have agreed on all material terms of the contract. The essential terms of this agreement include the terms of the subject matter of the agreement (transfer of ownership of crypto assets, etc.), other terms and conditions that are defined by law as essential or necessary for this type of agreement (placement of a computer program with an algorithm for concluding and/or executing an agreement in the blockchain system, price of the crypto asset, etc.), as well as all those terms and conditions on which at least one of the parties must agree (term of the agreement, etc.).

The provisions of part 1 of Article 639 of the Civil Code of Ukraine give grounds to conclude that a crypto asset smart contract may be concluded in any form, unless the requirements for the form of the contract are established by law.

Subject to the provisions of part 2 of Article 639 of the Civil Code of Ukraine, if the parties agree to enter into a smart contract using information and communication systems, in which all contractual terms are defined and executed automatically by means of a computer program implemented in blockchain technology, the smart contract is deemed to be concluded in writing from the moment it is provided in this form.

For the purposes of part 1 of Article 640 of the Civil Code of Ukraine, a smart crypto asset contract, in which certain contractual obligations are defined and/or performed automatically by a computer program, is concluded from the moment the person who sent the offer to enter into the contract receives a response on acceptance of this offer.

Pursuant to Article 627(1) ('Freedom of contract') and Article 640(2) ('Moment of contract conclusion') of the Civil Code of Ukraine, if, in accordance with a civil law act or the terms of the contract, the conclusion of a crypto asset smart contract also requires the transfer of money, transfer of other property or performance of another action, the smart contract is concluded from the moment the relevant property is transferred or a certain action is performed.

Pursuant to Article 640(3) of the Civil Code of Ukraine, a crypto asset smart contract, in which certain contractual obligations are defined and/or performed automatically by a computer program, is concluded in writing and is subject to notarisation, is considered to be concluded from the date of such notarisation.

As agreement may be made orally or in writing (electronic form) and smart contracts are distributed ledger technologies-based bilateral transaction represented by a computer program, certain or all terms of which are defined and/or fulfilled automatically by computer program, smart contracts are subject to the provisions of applicable law (for example, the Article 205 (1) of the Ukrainian CC) on the written (electronic) form of an agreement.

2.3 *Types of smart contracts*

Currently, there are 5 types of forms of smart contracts that have different functions and applications including basic token contracts (SAFT, 2023),[24] crowd sale contracts

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[24] SAFT (Simple Agreement for future Tokens): The Ultimate Guide + Free Template. January 26, 2023. Access: https://legalnodes.com/template/simple-agreement-for-future-tokens.

(Crowdsales. OpenZeppelin),[25] mintable contracts (What is mintable?),[26] refundable contracts (Refundable contract),[27] and terminable contracts[28] (Business-law Thu and Name, 2020).[29]

Of the five types of forms, four of which are types of smart contracts that are commonly used in the sale and purchase of cryptocurrencies (Business-law Thu and Name, 2020).[30]

Whereas Terminable Contract is a form of smart contract that can be used for blockchain systems in buying and selling goods online and executing blockchain programs in financial services.

The use of smart contracts in the online marketplace specifically as an electronic contract agreed by the parties, which then the electronic contract is recorded in the blockchain system (Novera, 2020).[31]

The use of smart contracts aims to make online trading easier, more efficient and secure, and is one of the technologies that has the potential to support economic growth in countries (Business-law Thu and Name, 2020).[32]

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[25] Crowdsales are a popular use for Ethereum; they let you allocate tokens to network participants in various ways, mostly in exchange for Ether. They come in a variety of shapes and flavors. (See, Crowdsales. OpenZeppelin. Access: https://docs.openzeppelin.com/contracts/2.x/crowdsales.

[26] Mintable is a collection of smart contracts that enable everyday users to create digital items on the blockchain. (See, What is mintable? Access: https://docs.mintable.app/ethereum-version/basics/what-is-mintable) Mintable tokens are minted via smart contracts supported by smart contract platforms like Ethereum. (See, What is a Mintable Token? 29/04/2022. Access: https://www.certik.com/resources/blog/42yeLemkn7XOx0Di8LkNp9-what-is-a-mintable-token).

[27] Refundable contracts are legally binding agreements that include a promise by the provider to pay an entrance free refund or repurchase the resident's interest in a continuing care retirement community. (See, Refundable contract definition. Access: https://www.lawinsider.com/dictionary/refundable-contract).

[28] Terminable contracts are contracts that can be terminated by one or both parties under certain conditions.

[29] See, Business-law Thu and Name*, "MENGENAL KONTRAK ELEKTRONIK, CLICK-WRAP AGREEMENT DAN TANDA TANGAN ELEKTRONIK," Business Law. [Online]. Available: https://business-law.binus.ac.id/2017/03/31/mengenalkontrak-elektronik-click-wrap-agreement-dan-tandatangan-elektronik/. [Accessed: 14-Jan-2020]; Tech in Asia Indonesia - Komunitas Online Startup di Asia. [Online]. Available: https://id.techinasia.com/smart-contract-dankontroversinya [Accessed: 14-Jan-2020]; Vian Endramanto, Agri Adriel Bororing, Anak Agung Istri Krisna Gangga Dewi, Gunawan Wang, Sfenrianto, Applying Smart Contract in Indonesian E-Commerce. International Journal of Advanced Trends in Computer Science and Engineering. 2021. Volume 10, No. 5. 3020:3022.

[30] Business-law Thu and Name*, "MENGENAL KONTRAK ELEKTRONIK, CLICK-WRAP AGREEMENT DAN TANDA TANGAN ELEKTRONIK," Business Law. [Online]. Available: https://business-law.binus.ac.id/2017/03/31/mengenalkontrak-elektronik-click-wrap-agreement-dan-tandatangan-elektronik/. [Accessed: 14-Jan-2020]

[31] See, Novera, A. & Utama, M. "Kedudukan E-Contract di Indonesia", 2014 Available: http://repository.usu.ac.id/bitstream/handle/123456789/59409/Chapter%20II.pdf;sequence=3; business-law Thu and Name*, "MENGENAL KONTRAK ELEKTRONIK, CLICK-WRAP AGREEMENT DAN TANDA TANGAN ELEKTRONIK," Business Law. [Online]. Available: https://business-law.binus.ac.id/2017/03/31/mengenalkontrak-elektronik-click-wrap-agreement-dan-tandatangan-elektronik/ [Accessed: 14-Jan-2020].

[32] Business-law Thu and Name*, "MENGENAL KONTRAK ELEKTRONIK, CLICK-WRAP AGREEMENT DAN TANDA TANGAN ELEKTRONIK," Business Law. [Online]. Available: https://business-law.binus.ac.id/2017/03/31/mengenalkontrak-elektronik-click-wrap-agreement-dan-tandatangan-elektronik/. [Accessed: 14-Jan-2020]

The UK Law Commission Report on Smart contracts provides for three different forms that smart contracts can take, namely: (1) natural language contract with automated performance; (2) hybrid contract; (3) solely code contract.

Natural language contract with automated performance is a natural language contract in which the performance of some or all of the contractual obligations is automated by a piece of code deployed on a distributed ledger. The code itself does not record any contractual obligations but is merely a tool employed by the parties to perform those obligations.

Natural language contract with automated performance provides for negotiations and terms in natural language, and its performance is carried out by code. A hybrid smart contract is a combination of code and natural language. The terms of a hybrid contract could be primarily written in code with natural language terms employed to add certain provisions (for example, governing law and jurisdiction clauses and dispute resolution mechanisms). In addition, the terms of a hybrid contract could be primarily written in natural language and include, by reference, just one or two provisions written in code. Hybrid smart contract provides for negotiations in natural language, terms in natural language and code and its performance is carried out by code.

The relationship between the code and the natural language elements is relevant.

Solely code contract is a contract that consists of code. No natural language version of the agreement exists. The parties agree the code and it executes on a distributed ledger. Alternatively, one party does all the coding and makes the program available on a distributed ledger where anyone with access to that ledger can run it. Solely code contract provides for negotiations in natural language and/or code, terms in code, and its performance is carried out by code.

The UK Law Commission initial view is that this type of contract is likely to present the most challenges from a contract law perspective, in terms of determining whether and when a legal contract is formed, and how that contract can be interpreted [UK Law Commission's Smart Contracts Summary, 2020][33].

2.4 *Legal regulation of smart contracts in common law and civil law jurisdictions*

Most legal orders, including the law of Ukraine, do not provide for legal rules (both general and special) on smart contracts based on blockchain technology.

The exception to this general rule is the law of the United States (Radić, 2020).[34] According to the law of the State of Arizona (USA), cryptographic signatures based on blockchain technology have the legal force of an electronic signature. A record that is a document or a contract based on blockchain technology is considered an electronic form and has the character of an electronic record that is a document. In fact, the legal effect or enforceability of a contract cannot be denied simply because it contains a smart contract clause. Thus, smart contracts are expressly permitted (Cilcrest & Carvalho, 2018).[35]

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[33] The UK Legal Commission. Smart Contracts. Summary of call for evidence
Access: https://clod-platform-e218f50a4812967ba1215eaecede923f.s3.amazonaws.com/uploads/sites/30/2020/12/Smart-Contracts-summary.pdf.

[34] See, Darko Radić, Dejan Pilipović SMART CONTRACT – CHALLENGES AND PERSPECTIVES 111–140: p. 122-123. International Scientific Conference of Special Importance: "Transformative Technologies: Legal and Ethical Challenges of the 21st Century" 07-08 February 2020, Banja Luka Conference Proceedings Međunarodni naučni skup od posebnog značaja: "Transformativne tehnologije: pravni i etički izazovi XXI vijeka", 07-08. februar 2020, Banja Luka Zbornik radova Banja Luka, 2020. godine.

Similar provisions are contained in the law of Nevada (USA) (Cilcrest & Carvalho, 2018).[36] The law of Vermont (USA) provides for a rebuttable presumption of validity of a contract based on blockchain technology (18).[37] Some other states have chosen to recognise smart contracts, i.e. blockchain technology, either in the form of actual legal implementation (Tennessee, Florida, Nebraska) or in the form of research projects (Hawaii, Illinois) (Blockchain State Legislation, 2020).[38]

UK Law Commission defines a smart legal contract as a legally binding contract in which some or all of the contractual obligations are defined in and/or performed automatically by a computer program (para 2.11.).

There are three features of a smart legal contract: (1) some or all of the contractual obligations under the contract are performed automatically by a computer program (“automaticity”); (2) the contract is legally enforceable; and (3) the computer program is deployed on a distributed ledger (para 2.12.) (UK Law Commission’s Smart Legal Contracts, 2021).[39]

A distinctive feature of smart legal contracts is automaticity: some or all of the obligations under the contract are performed automatically without the need for human intervention (para 2.14.) (UKJT).[40]

The main benefit of automating a contractual obligation is that it enables contractual performance to occur without the need for human intervention. Unlike a human being, a properly coded computer program is simply unable to refuse to act or fail to perform (Green, 2020).[41]

Once the conditions for its performance are met, the computer program will perform the contractual obligation automatically. For this reason, computer scientists sometimes refer to smart contracts as “self-executing” contracts. From a legal perspective, the “execution” of the computer program constitutes the performance of the contractual obligations.

The automation of a contractual obligation by a computer program requires that the obligation be converted or translated into code (UKJT).[42] Contractual obligations which follow a conditional logic (“if X, then Y”) are good candidates for being drafted in code, as conditional logic is inherent in computer programming (para 2.18.).

Some contractual obligations may not be suitable for automation by a computer program because they are not based on conditional logic and are therefore difficult to translate into code. These include obligations that require the exercise of discretion, reasonableness, best endeavours or some element of human judgement (para 2.20.).

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[35] Gilcrest, and Carvalho, „Smart contracts: Legal Considerations “. 3280.

[36] Gilcrest and Carvalho, „Smart contracts: Legal Considerations “. 3280.

[37] Gilcrest and Carvalho, „Smart contracts: Legal Considerations “. 3280.

[38] „Blockchain State Legislation “, National Conference of State Legislatures, accessed 17 February 2020, https://www.ncsl.org/research/financial-services-and-commerce/the-fundamentals-of-risk-management-and-insurance-viewed-through-the-lens-of-emerging-technology-webinar.aspx.

[39] Smart Legal Contracts. Advice to Government. Law Commission. CP 563. Law Com No 401. November 2021. Access: https://s3-eu-west-2.amazonaws.com/cloud-platform-e218f50a4812967ba1215eaecede923f/uploads/sites/30/2021/11/Smart-legal-contracts-accessible.pdf.

[40] UKJT Legal Statement at [135].

[41] S Green and A Sanitt, “Smart Contracts”, in P Davies and M Raczynska (Eds.), The Contents of Commercial Contracts: Terms Affecting Freedoms (1st ed. 2020).

[42] UKJT Legal Statement at [135].

«Legal» smart contracts should constitute legally binding contracts. Under the law of England and Wales, there are several requirements for the formation of a legally binding contract. These are: (1) agreement; (2) consideration; (3) certainty and completeness; (4) intention to create legally binding relations; and (5) formality requirements (compliance with formalities) (paras 2.21., 3.2.).

EU law provides for specific legal provisions relating to smart contracts.

The EU has passed a new harmonised rules fair access and use of Data (Data Act) with a mandate for smart contract issuers to include a "kill switch" to terminate smart contracts (Josh, 2023).[43]

Article 30 of the Data Act, which was passed on Tuesday, 14 March 2023, ensures that any smart contract must have a clearly defined mechanism to terminate or interrupt its operation.

An article of the Data Law, which was adopted on 14 March 2024, ensures that any smart contract must have a clearly defined mechanism for terminating or interrupting its operation.

The provision of Article 30 states:

> "Safe termination and interruption: ensure that a mechanism exists to terminate the continued execution of transactions: the smart contract shall include internal functions which can reset or instruct the contract to stop or interrupt the operation to avoid future (accidental) executions; in this regard, the conditions under which a smart contract could be reset or instructed to stop or interrupted, should be clearly and transparently defined.
>
> Especially, it should be assessed under which conditions non-consensual termination or interruption should be permissible." (Report on fair access and use of data, 2023)[44]

The other provisions in Article 30 include a section that ensures smart contracts have strong security features to prevent mistakes or tampering by third parties.

This has raised concerns about smart contracts' immutability and the DeFi ecosystem. The EU "kill switch" presents a challenge to this fundamental immutability, which many experts have found concerning.

Some authors believe this has the potential to undermine the technology itself. "Article 30, as currently drafted, goes a step too far in addressing the issues raised by immutability" (Schrepel, 2024).[45]

On 7 February 2019, the Italian Parliament approved a law on DLT and smart contracts. This Law introduces a legal definition of both DLT and smart contracts and recognizes their full validity and enforceability and stating that a smart contract meets the requirements of a written form, if this form is required by law (Durovic, 2019).[46]

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[43] See, Adams Josh, Will the "Kill Switch" in the EU's Data Act Kill Smart Contracts? 23 March 2023, Access: https://beincrypto.com/how-dangerous-is-the-eus-smart-contract-kill-switch/.

[44] See, REPORT on the proposal for a regulation of the European Parliament and of the Council on harmonised rules on fair access to and use of data (Data Act). Report - A9-0031/2023. Access: https://www.europarl.europa.eu/doceo/document/A-9-2023-0031_EN.html.

[45] Thibault Schrepel, Post. March 14, 2024. Access: https://twitter.com/ProfSchrepel/status/status/1635556417930252288.

In the Italian Law, smart contracts are defined as software based on DLTs which, once the relevant ledger entry has been validated, automatically give effect to the relevant terms agreed between two or more parties.

Smart contracts are deemed by law to be equivalent for certain purposes (i.e., consen sus formation and evidentiary value) to traditional written contracts to the extent that the digital authentication of the parties is made in accordance with the procedure to be established by AgID (The Agency for Digital Italy (Agenzia per l'Italia Digitale, “AgID”)).

The procedure is set in specific guidelines which is issued, and providing for the applicable technical standards (Lombardi, 2019).[47]

Sweden has implemented a project on the use of blockchain-based smart contracts in the sale of real estate and entry into the real estate register, given the reliability and speed provided by this technology, and as a result, the entire project was successfully completed in 2018 (Land Administration, 2020).[48]

In the Swedish doctrine of law, it is considered that smart contracts may indeed be recognized as contracts as they fulfil mechanisms for concluding contracts that are regulated in the Swedish Contracts Act, such as offer-acceptance (Ingvarsson, 2020).[49]

Smart contracts may also be concluded on mechanisms that are not directly regulated by the Contracts Act, these include tacit agreements and standard form of contracts.

There are certain legal issues that are raised by the smart contracts. Torbjörn Ingvarsson draws attention to the self-execution of a smart contract as one of the aspects that could potentially prove problematic. This is because they can facilitate the automatic fulfilment of contracts that are null and void because they comprise illegal or immoral undertakings (Ingvarsson, 2020).[50]

2.5 *Legal nature of a crypto asset smart contract*

The basis of a crypto asset smart contract is a transaction made via the Internet and may be qualified, in accordance with clause 1 of Article 202 of the Civil Code of Ukraine, as an action of a person aimed at the acquisition, modification or termination of civil rights and obligations.

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[46] Mateja Durović and Franciszek Lech, “The Enforceability of Smart Contracts”, The Review of the Kopaonik School of Natural Law, no. 1 (2019): 81-82. See, Italian Law No 12/2019 in relation to the Law Decree No 135/2018 (Decreto Semplificazioni). Stefania Lucchetti, „Italian law gives legal value to blockchain and smart contracts “, Law Cross Border, March 11, 2019, accessed February 17, 2020. Access: https://lawcrossborder.com/2019/03/11/italianlaw-gives-legal-value-to-blockchain-and-smart-contracts/.

[47] Lombardi M., Squerzoni F., Trombetti V., Frattini M. Blockchain and Smart Contracts: Italy First to Recognize an Overarching Legal Foundation. 19 February 2019.

[48] „Land Administration“, ChromaWay, accessed February 17, 2020, https://chromaway.com/landregistry/.

[49] Torbjörn Ingvarsson, Smarta kontrakt i svensk avtalsrätt. 2020. Uppsala Universitet. Access: www.diva-portal.se/smash/get/diva2:1383569/FULLTEXT01.pdf.

[50] Torbjörn Ingvarsson, Smarta kontrakt i svensk avtalsrätt. 2020. Uppsala Universitet. Access: www.diva-portal.se/smash/get/diva2:1383569/FULLTEXT01.pdf.

A crypto asset smart contract must meet all legal requirements for a valid legal entity and a concluded agreement.

A crypto asset smart contract will be considered valid if the general requirements for the validity of a transaction in accordance with Article 203 of the Civil Code of Ukraine[51] are met when it is concluded.

Pursuant to Article 638(1) of the Civil Code of Ukraine, a contract is concluded if the parties have duly agreed on all material terms and conditions.

Therefore, the recognition of a crypto asset smart contract as a legally binding contract is essential to ensure that the results of the self-executing smart contract are enforceable and protected. If a smart contract cannot, for example, legally transfer ownership of the crypto asset it intends to transfer or does not have all the essential terms of a sales or insurance contract, then the smart contract may be declared invalid or unenforceable.

The essence of a crypto asset smart contract is that it is a self-executing contract that remains unchanged and unstoppable after the creation of a smart contract, the terms of which are included in the internal functions of a decentralised database that is not controlled by the databases of the parties to the contract or third parties.

The subject of discussion is whether a smart contract is a contract with a special form, or a type of contract concluded in electronic form.

Proponents of recognising a smart contract as a type of contract concluded in electronic form point out that the electronic form is an electronic document in which the parties set out the essential terms of the contract and which can be visually perceived. Since the parties to the contract are not able to verify the correctness of the transformation of the contract terms into the software code, it is necessary to preserve the electronic form of the contract, which is the basis for the formation of the code. If the information is distorted due to technical errors, the smart contract should be considered invalid. The electronic form of a smart contract can be used as evidence in court in the event of a dispute. It is possible to engage experts to analyse the information contained in the programme code.

Opponents of this approach point out that a smart contract cannot be considered as a type of contract concluded in electronic form, since, according to clause 3 of Article 3 of the Law of Ukraine 'On Electronic Commerce', the electronic form of information presentation is considered to be the documentation of information that allows it to be reproduced in a visual form suitable for human perception ["Law of Ukraine 'On Electronic commerce" [Law of Ukraine "On Electronic commerce", 2015][52]. The above is not consistent with the legal nature of a smart contract [Ivanov, 2022][53].

In our opinion, a smart contract of crypto assets should be considered as a transaction, the terms of which regarding the acquisition, transfer conditions and scope of rights to crypto assets (digital assets)[54] can be expressed in the form of algorithms and functions of the system for ensuring the turnover of virtual assets.

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[51] According to Article 203 of the Civil Code of Ukraine, a smart contract should provide for: legal content; the necessary scope of civil capacity of the parties; free expression of the parties' will that corresponds to their internal will; the form of the contract established by law; the contract's focus on the actual occurrence of legal consequences stipulated by it; a contract concluded by parents (adoptive parents) cannot contradict the rights and interests of their young, minor or disabled children.

[52] On electronic commerce: Law of Ukraine from 03.09.2015 № 675-XIX. Access: https://zakon.rada.gov.ua/laws/show/435-15/ed20030116 (date of access: 16.04.2022).

[53] Ivanov A. M., Shmyga V. O. Smart contracts in contractual relations: realities and prospects of use // Legal scientific electronic journal. 2022. No. 4. 151:152. – P. 151.

In this regard, it is advisable to supplement Article 205 of the Civil Code of Ukraine ("Form of Transaction. Methods of Expression of Will") with the provisions of Part 3 as follows:

> "3. A transaction in respect of a virtual asset may be made in the system for ensuring the turnover of virtual assets, and the conditions of acquisition, conditions of transfer and the scope of rights to virtual assets may be expressed in the form of algorithms and functions of the system for ensuring the turnover of virtual assets, within which the turnover of virtual assets is carried out."

2.6 *Terms of a smart contract for crypto assets*

To conclude a crypto asset smart contract, standard protocols are used that contain the terms of the smart contract, which may be specific, enforceable and legitimate, and may provide for security obligations.

The terms of a crypto asset smart contract may provide for security obligations, when a certain amount of cryptocurrency is blocked under the smart contract, which is transferred to the creditor only after the debtor performs certain actions.

The terms of a crypto asset smart contract must be specific (clear, unambiguous), feasible (objective), legitimate, capable of automation (no estimates such as "reasonable time" may be used), exist within the blockchain platform (where crypto assets are currently transacted).

Unless otherwise provided by the rules of the blockchain system, the terms of a smart contract may not provide for the receipt and confirmation of information from outside (in this regard, the terms of force majeure shall not be specified in the smart contract).

In the latter case, there are two possible options: the electronic form is fully transformed into a program code or only part of the electronic contract is reflected in the program code (Veres, 2020).[55]

In cases determined by the blockchain operator, smart contracts can be executed based on information received from the 'caller', which is the basis of one of the leading blockchain projects – Chain link (Blockchain).[56] In general, this functionality is available on the Ethereum blockchain.

This network is intended to be used to facilitate the transfer of tamper-proof data from off-chain sources to on-chain smart contracts.

The ability to receive data from sources outside the blockchain is implemented through the so-called oracles (Oracles; What is Blockchain).[57]

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[54] For the purposes of the smart contract, it is proposed to conditionally consider cryptoassets as an analogue of digital assets within the meaning of the Law of Ukraine 'On Digital Assets', since this Law, although it uses the term 'digital assets' rather than 'cryptoassets', at the present stage any digital assets provided for by the system for ensuring the turnover of digital assets are essentially cryptoassets.

[55] Veres I. Legal nature of a smart contract // Entrepreneurship, economy and law. 2020. № 9. 15:18. P. 17. - Access: xpgp-journal.kiev.ua/archive/2020/9/4.pdf.

[56] Chainlink (blockchain). Access: https://en.wikipedia.org/wiki/Chainlink_(blockchain).

[57] See, Oracles. Access: https://stellar.org/learn/smart-contract-basics-oracles; What Is a Blockchain Oracle? January 12, 2024. Access: https://chain.link/education/blockchain-oracles; Oracles. July 25, 2024. Access: https://ethereum.org/en/developers/docs/oracles/.

The use of oracles allows the terms of smart contracts to be fulfilled depending on the circumstances of the real world (weather conditions, a ship entering neutral waters or vice versa, arrival at a port, the value of a certain asset on the stock exchange reaching a certain level, etc.)

At the same time, it can be assumed that the current inability to include evaluative terms in the content of a smart contract will be overcome in the future due to the development and application of artificial intelligence. The use of advanced artificial intelligence will enable the smart contract to 'live independently', which will allow the software to assess the circumstances in specific situations, evaluate the behaviour of certain parties, draw conclusions about the suspension of certain or the introduction of other conditions, etc. (Radić, 2020: 121).[58]

In other words, the smart contract will overcome the automatic phase and move to the level of autonomy, which will imply that the software (which will also be part of the contract) will learn through experience, change the instructions provided, create its own instructions and, on this basis, actually make decisions (Allen, 1996).[59]

2.7 *Conclusion, cancellation, modification, and termination of a crypto asset smart contract: Features of their storage*

The peculiarity of a crypto asset smart contract is that it is impossible to withdraw from this transaction if it was made and executed in relation to virtual assets in the system for ensuring the turnover of virtual assets, within which the turnover of virtual assets is carried out, and the peculiarities of the functioning of such a system do not allow the parties to withdraw from the transaction.

In this regard, it is advisable to supplement Article 214 of the Civil Code of Ukraine with a third part, according to which it is not allowed to withdraw from a transaction that has been made and executed in relation to a crypto asset.

A smart contract for the alienation of secured crypto assets by their issuer is a contract, which has specific features of amendment and termination.

A smart contract for the alienation of secured crypto assets by their issuer is a contract, which under no circumstances may be amended or terminated at the request of the party that has joined this agreement.

The issuer of a secured crypto asset is obliged to fulfil the obligation to transfer the collateral to the party that has joined or any other person, regardless of the grounds for acquiring the right to the relevant secured crypto asset.

If the terms of a smart contract for the alienation of secured crypto assets by their issuer contain conditions that make it impossible for the party that has joined or any other person to receive the collateral for the acquired crypto assets, such person is entitled to receive compensation from the issuer for damage related to the inability to receive the collateral from the issuer.

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[58] Darko Radić, Dejan Pilipović, SMART CONTRACT – CHALLENGES AND PERSPECTIVES 111–140: p. 121. International Scientific Conference of Special Importance: "Transformative Technologies: Legal and Ethical Challenges of the 21st Century" 07-08 February 2020, Banja Luka Conference Proceedings Međunarodni naučni skup od posebnog značaja: "Transformativne tehnologije: pravni i etički izazovi XXI vijeka," 07-08. februar 2020, Banja Luka Zbornik radova Banja Luka, 2020. godine.

[59] See, Tom Allen and Robin Widdison, "Can Computer Makes Contracts?" Harward Journal of Law & Technology 9, no. 1 (Winter 1996): 27.

In this regard, it is advisable to supplement the Civil Code of Ukraine with Article 634-1 “Peculiarities of Conclusion and Execution of the Accession Agreement on Alienation of Secured Digital Assets by their Issuer.”

A crypto asset smart contract has specifics regarding the grounds for amending or terminating this contract.

A smart contract for the alienation of a crypto asset that has been concluded and executed in the crypto asset turnover system cannot be amended or terminated by a court decision.

In this regard, it is advisable to supplement Art. 651 of the Civil Code of Ukraine with a part stating that a virtual asset alienation agreement cannot be amended or terminated by a court decision.

The peculiarity of a smart contract for custody of crypto assets is that the custodian may accept crypto assets for custody under this agreement, concluded in writing. In case of acceptance for storage of crypto assets that are interchangeable, the custodian is obliged to return the same amount of crypto assets to the depositor, and in case of acceptance for storage of non-interchangeable crypto assets - the same crypto assets.

In this regard, it is advisable to supplement the Civil Code of Ukraine with Article 971-1 Storage of Digital Assets in the above wording.

2.8 *Execution of a crypto asset smart contract*

The execution of a crypto asset smart contract is carried out automatically by digital transmissions in a certain sequence in the event of certain circumstances, without the participation of the parties, unlike a conventional contract, when the parties are obliged to perform certain actions.

A smart contract is executed when the smart contract code is executed, which is triggered by a certain transaction initiated by an external user. A smart contract can be called by another smart contract, which in turn was called by another smart contract, but at the beginning of this chain of calls there must be a call made by an external user (Chornyi, 2020).[60]

Fulfilment of obligations under a smart contract is carried out automatically by performing digital transactions in a certain sequence in the event of certain circumstances.

A smart contract contains an obligation that makes it possible to revolutionise everything from the supply of chains (crypto assets) and transactions involving their alienation. However, from a theoretical and practical point of view, it is not clear what the legal consequences of non-fulfilment or breach of a smart contract are. Is this “code as a right” legally binding? Can a smart contract be enforced in a traditional court or arbitration?

The issue of whether a smart contract for crypto assets can be enforced because of non-performance or fraud, or mistake is the subject of discussion.

Proponents of the traditional approach believe that smart contracts are a type of contract and therefore enforceable like other contracts under the applicable law of the relevant country. However, in the case of smart contracts, it is unlikely that enforcement will be necessary as they are automatically enforceable.

Other authors deny the enforceability of smart contracts, as they are algorithms in the blockchain that automatically fulfil obligations in such a way that all participants can immediately receive the provision without involving any intermediary or wasting time. So, if a party to a contract wants to enforce a smart contract, what exactly is being enforced? Proponents of this approach believe that a court or arbitration will not waste time on uncertainties or indefinite contracts.

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[60] Chornyi O. M. Cryptographic protocols of electronic cash based on blockchain technology. Access: http://ela.kpi.ua/bitstream/123456789/23503/1/Chornyi_magistr.pdf (Date of access: 12.08.2020).

Every contract involves an agreed or unified expression of will between the parties, which gives rise to obligations. A smart contract also arises because of the will of the parties, the difference being that it is made in the form of a computer code via blockchain technology. To be fulfilled, it is required to fulfil a pre-established condition that is registered in the blockchain by entering the relevant computer code.

It is worth noting that a smart contract, like any contract, may be declared invalid if the will to enter it does not meet the conditions for the validity of this transaction, regardless of the form in which this transaction is concluded, as in this case in the form of a computer code.

There is a point of view that provides for the admissibility of invalidation or enforcement of a smart contract if its terms provide for defective expression of the parties' will to enter it and enforce this contract, since blockchain technologies make it possible to provide for these conditions in the electronic register.

This approach has the right to exist but requires a clearer understanding of the legal consequences if the code does not contain conditions of invalidity or compensation for damage. In this case, the question of the admissibility of the conditions of validity provided for by applicable law (e.g., the Civil Code of Ukraine), the legal consequences of breach and liability for breach of contractual obligations remains relevant.

In view of the fact that a smart contract creates an obligation, it is appropriate to apply to this transaction the provisions of the applicable law of the relevant state regarding the legal consequences of breach of obligation and responsibility for breach of obligation (for example, Articles 203, 611-625 of the Civil Code of Ukraine, if the law of Ukraine is the applicable law).

In this regard, the proposal to provide for the following grounds for the invalidity of a smart contract in the law is noteworthy: if the software code reproduces conditions that do not correspond to the content of the smart contract according to the electronic document, the smart contract may be declared invalid (Veres, 15).[61]

2.9 *Liability for breach of a crypto asset smart contract*

The issue of liability for breach of a smart contract is relevant, due to the complexity of imposing civil liability on a particular person in the context of crypto asset smart contracts, which are self-executing transactions built into blockchain technology.

A crypto asset smart contract may contain code errors, flaws, and other vulnerabilities. There may be unforeseen circumstances, unexpected events or data during the execution of the code. The program code may affect the performance of the smart contract and the corresponding legal consequences. However, it can be difficult to identify the person who is responsible due to the absence of an obligated person under the contract, which is due to the peculiarities of distributed ledger technology.

In this regard, the approach the approach deserves attention according to which the determination of the person on whom legal liability is imposed when a crypto asset smart contract fails to perform the programmed function depends on the terms of the smart contract, and in their absence, the provisions of applicable law on the legal consequences of failure to fulfil a contractual obligation and liability for failure to fulfil an obligation are applicable.

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[61] Veres I. Legal nature of a smart contract // Entrepreneurship, economy and law. 2020. № 9. 15:18. P.15. - Access: xpgp-journal.kiev.ua/archive/2020/9/4.pdf.

3. Conclusions

The conducted analysis of the smart contract of crypto assets gives grounds for such conclusions.

A smart contract should be viewed as a legally binding contract that is represented and executed by a computer program, remains unchanged and uninterrupted after its creation, and its terms are included in the internal functions of a decentralised database that is not controlled by the databases of the parties to the contract or third parties.

The legal essence of a smart contract of crypto assets is that it is a self-executing contract that remains unchanged and unstoppable after the creation of a smart contract, the terms of which are included in the internal functions of a decentralized database that is not under the control of the databases of the parties to the contract or third parties.

Despite the absence of special legal provisions on smart contracts in the applicable law, these electronic contracts might be recognised as contracts that give rise to legally enforceable obligations to the extent that smart contracts comply with the provisions of civil law on the form and procedure for concluding contracts, such as the electronic form of a transaction, offer and acceptance, and the conditions for the validity of a contract.

Since agreements may be made orally or in writing (electronic form) and smart contracts are distributed ledger technologies-based bilateral transaction represented by a computer program, smart contracts are subject to the provisions of applicable law (for example, the Article 205 (1) of the Ukrainian CC) on the electronic form of a agreement.

The terms of a smart contract of crypto assets should be specific (clear, unambiguous), feasible (objective), valid, capable of automation (evaluative terms such as “reasonable term” cannot be used), exist within the blockchain platform (on which transactions are currently carried out transactions of crypto assets) and, unless otherwise provided by the rules of the blockchain system, do not provide for the receipt and confirmation of information from the outside (in this regard, the terms of force majeure are not specified in the smart contract).

A smart contract of crypto assets, like any contract, can be declared invalid if the will to enter into it does not meet the conditions of validity of this transaction, regardless of the form in which this transaction is concluded, as in this case in the form of computer code. Considering the fact that the smart contract of crypto-assets is a transaction that gives rise to obligations, it is appropriate to apply to this transaction the provisions of the applicable law of the country regarding the legal consequences of violations of obligations and liability for violations of obligations (for example, Articles 203, 611-625 of the Civil Code of Ukraine, if the law of Ukraine is the applicable law).

As a crypto asset smart contract is a transaction that can creates a legally binding obligation, it is advisable to apply the provisions of the applicable law of the country regarding the legal consequences of breach of obligation and liability for breach of obligation to this transaction (for example, Articles 203, 611-625 of the Civil Code of Ukraine, if the law of Ukraine is applicable).

The determination of the person who is legally responsible when the cryptoasset smart contract does not perform the programmed function depends on the terms of the smart contract, and in their absence, the provisions of the applicable law regarding the legal consequences of non-fulfillment of a contractual obligation and liability for non-fulfillment of an obligation are applicable.

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